

Cornell Engineering

Robert Frederick Smith School of Chemical and Biomolecular Engineering

UNDERGRADUATE DEGREE PROGRAM

Chemical engineers work with chemical change and chemical processing. You might develop ways to produce chemicals, or design, build, and operate a chemical production plant. You might search for new sources of energy or work to clean up the environment. Or you might play an important role in new technologies such as semiconductor processing and biotechnology or in the development of new materials such as polymers and ceramics.

BREAK THE RULES to CONTEMPLATE NEW APPLICATIONS

Chemical engineers are involved in producing all kinds of goods, from plastics, textiles, and fertilizers, to processed foods and antibiotics. Chemical engineers also work in new areas of biotechnology, including designing new methods to fight life-threatening diseases and more effective ways to deliver medications.

Chemical engineers are in demand in many fields, including, petroleum, chemical, pharmaceutical, electronics, consumer-products, and food-processing industries. Many find professional opportunities in government agencies, research laboratories, and academic institutions, and a good number rise to positions of considerable technical and managerial responsibility.

Cornell's undergraduate program in Chemical Engineering (ChemE) offers a sequence of courses beginning in your sophomore year and extending through your senior year. The fundamental analytic tools of chemical engineering—chemical kinetics, chemical thermodynamics, and fluid mechanics—are developed in the second and third years. These tools are used to analyze the units of chemical processes: chemical reactors, bio-reactors, distillation columns, and heat exchangers. As a senior, students design chemical processes by integrating process units with attention to economics, safety, and environmental impact. Concentrations in biomolecular engineering, polymeric materials, and energy are available.

During your first year, students should take CHEM 2090: Engineering General Chemistry (or CHEM 2150: Honors General and Inorganic Chemistry, if you have scored of 5 on the CEEB AP Chemistry Exam), and CHEM 2080: General Chemistry II.

CHEME REQUIRED COURSES

ENGRD 2190	Chemical Process Design and Analysis
CHEM 2510	Introduction to Experimental Organic Chemistry
CHEM 2900	Introductory Physical Chemistry Laboratory
CHEM 3530 or CHEM 3570	Principles of Organic Chemistry Organic Chemistry for the Life Sciences
CHEM 3890	Honors Physical Chemistry I
CHEM 3900	Honors Physical Chemistry II
CHEME 3010	Career Perspectives
CHEME 3130	Chemical Engineering Thermodynamics
CHEME 3230	Fluid Mechanics
CHEME 3240	Heat and Mass Transfer
CHEME 3320	Analysis of Separation Processes
CHEME 3720	Introduction to Process Dynamics and Control
CHEME 3900	Chemical Kinetics and Reactor Design
CHEME 4320	Chemical Engineering Laboratory
CHEM 4620 or CHEM 4630	Chemical Process Design Practice of Chemical Engineering Product Design

CHEMICAL ENGINEERING



SOME AREAS OF FACULTY RESEARCH

battery power, storage, and transmission

biochemistry and biophysics of biological systems

biological network fragility

biomass conversion

biomedical research and biotechnology

energy harvesting efficiency of solar cells using photonic crystals

geothermal science

interfacial science

material properties in nanofibers

photonic materials and solar energy capture

polymer rheology

protein conformational studies

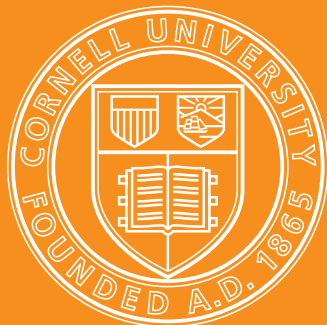
soft matter

surface science of organic and inorganic materials

synthetic biology

systems biology

transport in complex fluids



Cornell University is an equal-opportunity affirmative-action educator and employer. Produced by the Office of Engineering Admissions.

MASTER OF ENGINEERING DEGREE PROGRAM

The Master of Engineering (M.Eng.) degree at Cornell's Robert Frederick Smith School of Chemical and Biomolecular Engineering, enables new as well as practicing, engineers to earn professional degrees while building expertise in related fields. The diverse personal and academic backgrounds of our faculty and students, and Cornell's vast facilities, make this an exceptional program in which to pursue one of the following areas of specialization:

- **computational informatics;**
- **energy economics and engineering;**
- **medical and industrial biotechnology;**
- **product design**

This professional degree gives you the opportunity to:

- gain specialized focused knowledge in areas central to chemical engineering;
- deepen your knowledge of one topical area related to chemical engineering by specializing in an area of study, such as polymers, electronic materials, engineering management, food engineering, etc.;
- broaden your skills (e.g., take courses in finance, marketing, language proficiency, entrepreneurship, etc.);
- undertake original research in one of the faculty research programs.

CHEME By the Numbers

ChemE undergraduate students	197
CBE graduate students	180

Starting salaries of B.S. Chemical Engineering graduates (for 2018)

Low	\$42,500
Median	\$74,000
High	\$101,000

CHEME SAMPLE ELECTIVE COURSES

CHEME 2880	Biomolecular Engineering: Fundamentals and Applications
CHEME 3700	Applied Process Control
CHEME 4020	Molecular Principles of Biomedical Engineering
CHEME 4130	Introduction to Nuclear Science and Engineering
CHEME 4610	Concepts of Chemical Engineering Product Design
CHEME 4710	Lean Operations Design and Process Optimization
CHEME 4840	Microchemical and Microfluidic Systems
CHEME 4880	Global Food, Energy, and Water Nexus
CHEME 5208	Renewable Resources from Agriculture
CHEME 5430	Bioprocess Engineering
CHEME 5440	Advanced Principles of Biomolecular Engineering
CHEME 5720	Managing New Business Development

cheme.cornell.edu